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THE EARLIEST PRINTED ILLUSTRATIONS OF NATURAL HISTORY

By Professor WILLIAM A. LOCY
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IN 1475, soon after the completion of the first quarter-century of printing, there appeared in Augsburg a popular book on natural history illustrated by woodcuts of animals and plants, some of which bear internal evidence of having been drawn from nature and of having been especially prepared for this book. Under the archaic title "Das Puch der Nature" by Conrad von Megenberg we have the prototype of illustrated treatises on natural history and popular medicine. It stands alone and is not genetically connected with any other; nevertheless it was the first of its kind, and perhaps it served as a model for other illustrated books of similar purpose which were published in Germany within the next ten or fifteen years. Conrad's book of nature passed through six editions before the year 1500 and enjoyed a wide circulation; we might even speak of it as one of the best sellers of the period, and thus the venture of the enterprising publisher, Hans Bämler, justified itself.

Since the book was the first to contain printed pictures of animals and plants it is of especial interest and challenges examination, not alone for philological study of the old dialect (Bavarian-Austrian) in which it is printed, but more especially as representing the scientific aspect of the period.

Another book, the "Gart der Gesuntheit" ("Herbarius zu Teutsch," etc.), published in Mainz in 1485, surpasses all others in the quality of its illustrations even up to the herbal of Brunfels published in 1530. This statement is so much at variance with the commonly expressed opinion of well-known writers of biological history (Sachs, Greene, Miall and others) that it seems desirable to reexamine the originals of each of these books from the standpoint of content and quality of illustrations. Both books are very rare and have been accessible to few naturalists. One bibliographer, Dr. Jos. Frank Payne, has (1902) discerned the unique position occupied by the Gart, "the publication of which (he says) forms an important landmark in the history of botanical illustration, and marks perhaps the greatest single step ever made in that art. It was not only unsurpassed but unequaled for nearly half a century." Dr. Payne does not comment on the few pictures of animals in the "Gart der Gesuntheit" but they are equally notable.

The book of nature and the "Gart" (for this title see below) have not received the notice of which they are deserving partly because attention has been diverted from them by the notice given to the Hortus Sanitatis which was published in 1491 and in many editions thereafter. The "Hortus Sanitatis" belongs to the same family of publications as the "Gart der Gesuntheit," but on account of its size, its numerous illustrations (1066), its later date of publication and its great popularity, it has been natural to assume that the "Hortus Sanitatis" represented the highest development of this class of books, and as a consequence, the two earlier (and much rarer) books have been passed by lightly and much greater attention given to the "Hortus Sanitatis."

The book of nature (1475) and the "Gart" (1485) not only antedate the Hortus Sanitatis but they are superior to it in several particulars; as already mentioned this superiority is especially marked in the better class of illustrations of the "Gart." These two early printed books represent a forward trend of the human spirit and should come under separate consideration. If ever we are able to gage the thought-life of the later Middle Ages, and especially of that interesting period of intellectual development just preceding the full bloom of the Renaissance, it must be accomplished by a study of the publications of the period. Accordingly, let no one assume that these books are merely curiosities of antiquarian interest.

The books of the time which have claimed most attention from scholars show another phase of the mental life of the period—that of the mystical-minded scholar and the theologian whose writings were more subjective in type, while Conrad's book, as well as the "Gart," represent the more objective or scientific attitude of mind. These two currents of mental life ran parallel, but at this time the instinct for creation through subjective methods was more conspicuous and the scientific attitude was undeveloped if not primitive.

The literary output of the period was more diversified than one might at first suppose. Besides Bibles, books of devotion, the famous "City of God" of Augustine, other religious writings and also legal treatises, a reader of the period found to hand printed copies of secular writings—some of belles-lettres and others of diversion: Dante, Petrarch, Boccaccio, Chaucer, Aesop's fables, the Bidpai stories showing affinities with the "Arabian Nights," Breidenbach's travels, the "Dialogues of the Creatures," "Reynard the Fox," "Romaunt of the Rose," etc. All these lay outside the field of the scientific and realistic books which were embodied in medical treatises and nature books.

Also dealing with nature (as well as other subjects) were such writings as the huge encyclopedias of Vincent of Beauvais, the "Properties of Things" by Bartholomæus Anglicus and the "Liber de naturis rerum" of Thomas of Cantimpré (the latter being the original of

Conrad's book of nature). Furthermore, it should be remembered that the printing presses were turning out on a relatively large scale the remains of classical and early mediaeval learning. Among these may be mentioned the scientific writings of Aristotle, Theophrastus, Pliny, Dioscorides and Galen.

But the book publishers of the period were desirous to stimulate a wide market for the sale of their wares and did not depend wholly on curiosity and mental interest. In the Latin preface of the "Hortus Sanitatis," published in 1491, there is a clever appeal to the commercial instinct. The writer, or compiler, says that he has been moved first and foremost by compassion for the poverty of those sufferers who have not the means to hire doctors and apothecaries and that by the teachings of the book these persons "with quite small expense to themselves will be able to compound helpful remedies and perfect medicines." This gives it the character of a book on popular medicine intended for the people. Another feature had more influence on the thought of the time; by pictures and descriptions, the attention of the people was directed to the productions of nature and information was spread regarding animals, plants and minerals. As Klebs says, "almost the entire structure of modern (biological) science rests on such humble beginnings." These books gathered what the monastic student had "milked," often uncritically, from the brain of the ancients and added comments and observations of their own. These additions mark the onset of inductive science. On the whole, the "Book of Nature," the "Gart" and other similar books represent a phase of the struggle to get away from the mystical and the subjective and to arrive at independent observation of nature. This was the call of the human spirit to engage in objective studies to which some types of mind are temperamentally inclined.

CONRAD VON MEGENBERG'S "PUCH DER NATURE"

This nature book was a German translation, with some changes, from the Latin "De Naturis Rerum" of Thomas of Cantimpré. The original was completed by Thomas about 1248, and translated by "Cunrat von Megenberg" a hundred years later. It was a complete review of nature and the first book of its kind of the Middle Ages. The German translation existed in manuscript for 125 years before it was first printed in 1475. That it was popular and widely circulated in manuscript form is attested by the numerous manuscripts in existence. Pfeiffer mentions 17 copies of the German translation in the library at Munich, 18 are reported from Vienna and many copies are known in other continental libraries.

In its printed form the book is now very rare. There are two copies of the first (1475) edition in the United States, both in the J. Pierpont Morgan library at New York. Through the courtesy of Mr. Morgan and

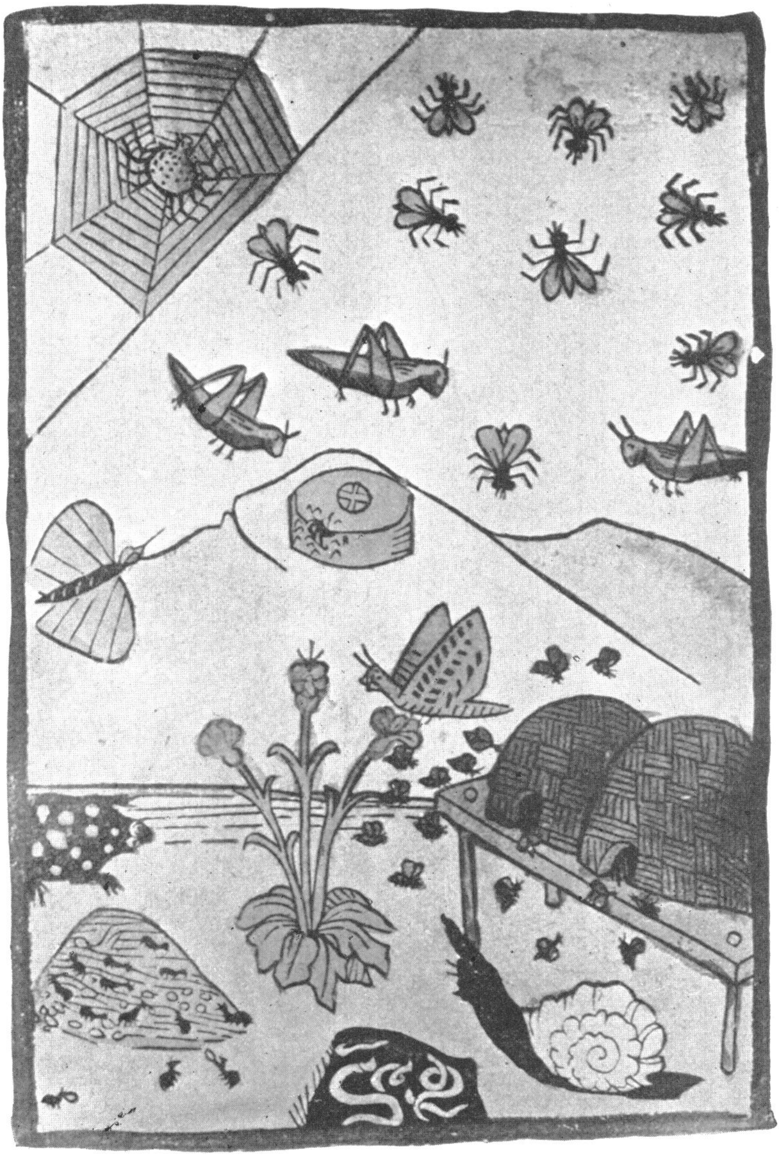


FIG. 3. PHOTOGRAPH OF A FOLIO PLATE OF INVERTEBRATES. PUCH DER NATURE (1475). ORIGINAL IN THE J. PIERPONT MORGAN LIBRARY

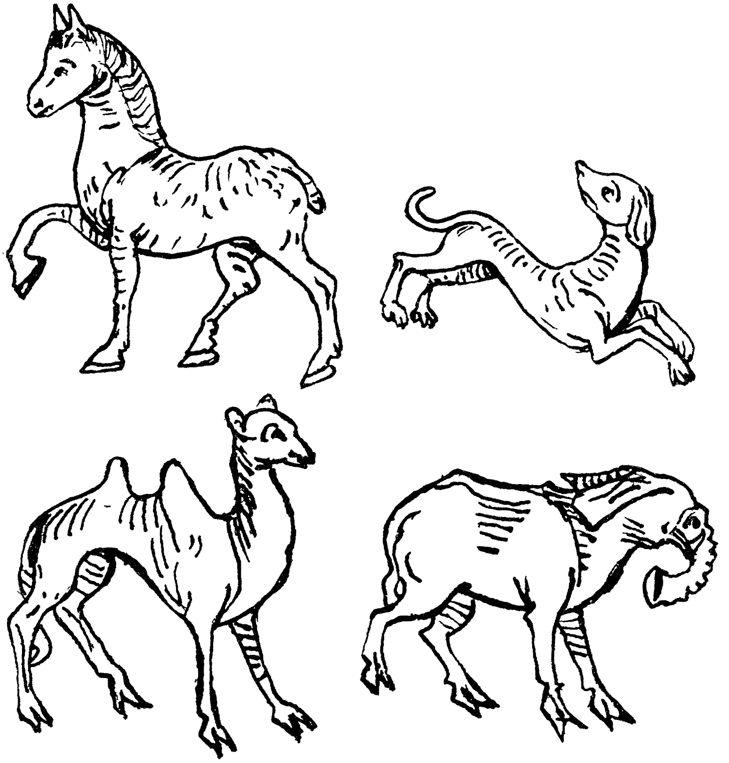


FIG. 1. TRACING OF FOUR FIGURES FROM A FOLIO PLATE OF TWELVE QUADRUPEDS. PUCH DER NATURE (1475). ORIGINAL IN THE J. PIERPONT MORGAN LIBRARY

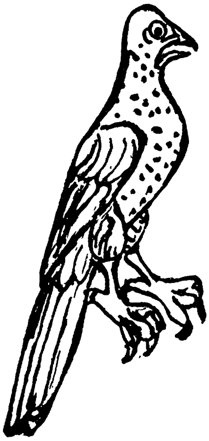


FIG. 2. TRACING OF THE FALCON FROM A PLATE OF THIRTEEN BIRDS. PUCH DER NATURE (1475). ORIGINAL IN THE J. PIERPONT MORGAN LIBRARY

his librarian I have had the opportunity of examining these books and taking photographs of the plates.

The short foreword, which was probably inserted by the publisher, telling the scope and the source of the book is as follows:

> Here follows the book of nature which treats first of the peculiarities and nature of man, then of the nature and the properties of the heavens, of beasts, of birds, of plants, of stones and of many other natural things. And upon this book a highly learned man worked for fifteen years collecting for his use from the following named sacred and secular teachers, poets and other approved doctors of medicine, such as Augustine, Ambrosius, Aristotle, Basil, Isadore, Pliny, Galen, Avicenna, etc., and many other masters and teachers. Out of these and others he read, made excerpts and compiled the book. Which book Master Conrad von Megenberg transferred from Latin into German and wrote it out. Here is a useful and entertaining material from which every man can learn many unusual things.

Among the several other authorities cited in the book, but not mentioned in the preface, is the "Physiologus."

In its original form, therefore, it purported to be merely a compilation and not a book of original studies. After fifteen years of labor Thomas of Cantimpré had completed the "De nàturis rerum" and Conrad merely translated it. The German translation was repeatedly printed and widely distributed, while the original remains unpublished to this day. A curious turn of fate, as remarked by Sudhoff who says further, that the original Thomas, "in spite of all its faults and errors, had always served as an important document of medieval science and deserved publication certainly more than many another work."

Conrad's translation was not made directly from the text of Thomas, but, as Haupt has shown, from a working over and rearrangement of Thomas by Bishop Albert of Regensburg.

Conrad, the translator, was a cleric and teacher, who after various vicissitudes of life, became Canon at Regensburg. Evidently he was a lover of nature and had written a book on the world (Sphæra) and another on the "Gestelt der Welt." In translating the book of nature he says he rearranged and added to the book as well as omitted some points. Indeed, some of the manuscripts of Thomas contain an account of 193 animals not found in the translation (Carus), but there still remain 267 animals commented upon. He seems to have improved and added to the plants (Meyer). From time to time, he makes original comments, either expressing doubt of some statement or adding a remark of his own—introducing what he has to say by "I also Megenberger says"—but these comments are not of weighty importance.

Evidently the manuscript used by Conrad did not contain the author's name since he expresses doubt as to the writer of the Latin book, "whether Albertus Magnus or not, I do not know." The source of the book, however, is now well established.

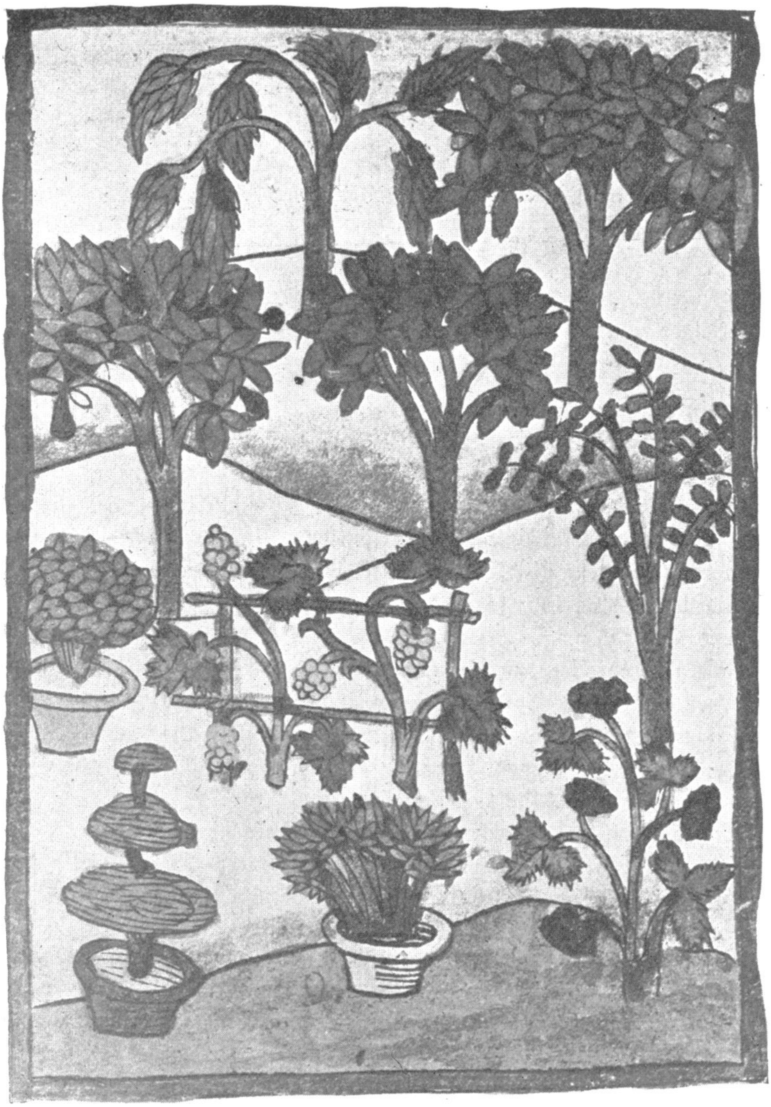


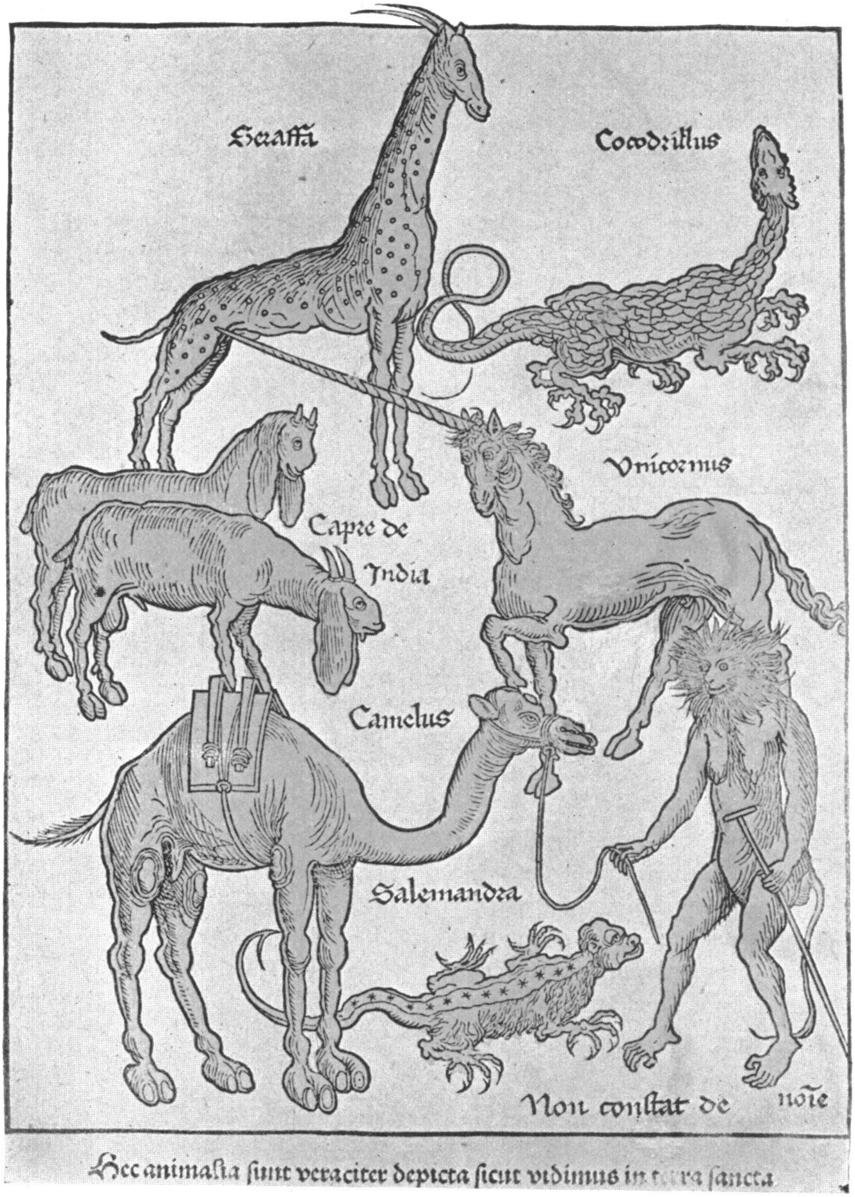
FIG. 4. PHOTOGRAPH OF ONE OF THE TWO BOTANICAL PLATES. PUCH DER NATURE (1475). ORIGINAL IN THE J. PIERPONT MORGAN LIBRARY

A complete copy of Conrad's book should contain 292 folio leaves and twelve plates of woodcuts. The two copies of 1475 which I have seen in the J. Pierpont Morgan library are rather handsome volumes as to format and printing. They were derived from the library of William Morris. Each copy contains the twelve folio plates and is nearly complete as to text. This is somewhat notable, since Hugh William Davis says that five of the plates are missing in the copy of the first edition in the British Museum. All cuts of both books in Mr. Morgan's library are colored alike in detail; accordingly, I presume that they were both done by the same hand or that there was a conventional type of coloring prevailing at that time.

The descriptive part of the book is disappointing. The art of description rests on good observation and at this period independent observation had not been developed. The text is chiefly a series of brief quotations from the writers of classical antiquity and the Middle Ages—Avicenna and Averroës (1198) being among the most recent. The excerpts are mainly folk stories and trivial observations about animal behavior. The book is comprehensive in range but the largest part of it is devoted to animals. In relatively brief compass, the text preserves for us the medieval lore about animals, plants and stones, but it is not descriptive science. I have not found a systematic or methodical description of any animal, but only quotations beginning "Aristotle says, Pliny says," etc. A few authors are cited under each title. Habits and behavior are spoken of but there is no description of appearance, color form, etc. Among flowers, rarely is the color of the flower mentioned (as frequently it is in the "Gart"). The comments on particular objects vary in length from seven lines up to two or three pages. Frequently one account occupies from one quarter to one half a page.

The general tone of the writing is shown by the following slightly abbreviated quotation about the lion. This is one of the longer (but by no means the longest) accounts and answers for the others.

> The Lion is king of all other animals, as Jacobus and Solinus say. This beast has nothing false, untrue or cunning about him. He is so hot by nature, that one may think he is always in a fever. The lioness always at first gives birth to five whelps,then to four, then to three, thereafter to two and the fifth time to one only. After that she is barren. Augustine says, when the cubs are born, they sleep three days until the father comes; he cries very loud over them, and being frightened by the noise they awaken. The lion fears the sharp sting of the scorpion and flees from it as from a deadly enemy. He fears also the rattling of wheels as they turn on the wagon, but he fears fire the most. Solinus says, that the lion is not easily angered, but being enraged, he seeks the offender (Zornmacher) and tears him to pieces. He never attacks man willingly, and only in great hunger. Adelius says, when the lion sleeps, he has his eyes open. When he travels, he blots out his footsteps with his tail, so that the hunter may not find him. Also Pliny says, that lions are friendly among themselves and do not fight. Aristotle says,



Hec animalia ſunt veraciter depicta ſicut vidimus in terra ſancta

FIG. 5. PHOTOGRAPH OF A FOLIO PLATE OF ANIMAL FIGURES. BREIDENBACH'S TRAVELS (1486). ORIGINAL IN THE J. PIERPONT MORGAN LIBRARY

the lion hides his bone the same as the dog. When in hunger, he draws with his tail a large circle on the ground and roars loud and frightens other beasts so they do not dare to come within the circle. He scorns the eating of yesterday and the remains of his former feasting. Some say that the lion dies of his own anger, he is so violent. The lion willingly captures the wild ass and chases him in nature. Ambrose says, when he is sick, if he catches an ape and eats him, he becomes well. When the lion drinks dog's blood, he becomes well. Solinus and Pliny say, that when the lion holds his tail quiet, he is mild and friendly; but that is seldom. . . . . Pliny says, that lion's flesh and especially the heart is good for people to eat; those who are too cold by nature, when they eat lion's flesh, will become warm. The lion's bones are so hard, that one can strike fire with them as with a flint. The lion's fat is an antidote against poison. When a man annoints himself with wine and lion's fat, it drives away all beasts from him, also snakes. The lion's fat is of warmer nature than that of any other animal. The lion is continually afflicted with a quartan fever so that he desires especially the flesh of apes, that he may become well. Lion's fat with oil of roses frees man's face from freckels, clears it and keeps it so. The lion's neck is thick and the flesh of the neck is cartilaginous, so he can not raise his head backwards. Alexander says, that the lion has great strength in his breast, in his fore feet and in his tail. *Leon* in Greek is a king, therefore is this beast called *leo,* because he is the king of all other beasts. The lion is warmer by nature in the fore part of the body and colder in the hinder part; also the sun is in the constellation of the lion. Aristotle says, that of all animals the lion has no marrow in its bones except in the femur. Therefore his bones are harder than those of any other animal, except the dolphin. The lion's intestine is like the dog's intestine. The lion is feverish in the summer, but is well in the winter. He also becomes feverish before the face of man.[1]

The duck is dismissed with seven lines, while the account of the hen is unusually long, occupying three and one-half pages. Regarding the ass, "Pliny says, it has white milk . . . that Nero was nourished on ass's milk."

Each of the twelve parts into which the book is divided is preceded by a general introduction in which one often finds moralizations and expression of theological views. In various places Conrad makes uncomplimentary allusions to the profligate priests (üppigen Pfaffen), who like the ass are weak when they should carry the cross and strong when they are unchaste. The bishop is compared to the peacock and also to the raven. It is merely a conjecture, but the great rarity of the book may be partly owing to these attacks on the priests. These allusions would naturally arouse the hostility of the very powerful theological bodies and, not unlikely, lead to attempts to suppress the book. In looking over the Index Librorum Prohibitorum, however, I have not found the "Book of Nature" on the prohibited list.

The illustrations in Conrad's book of nature are on twelve folio

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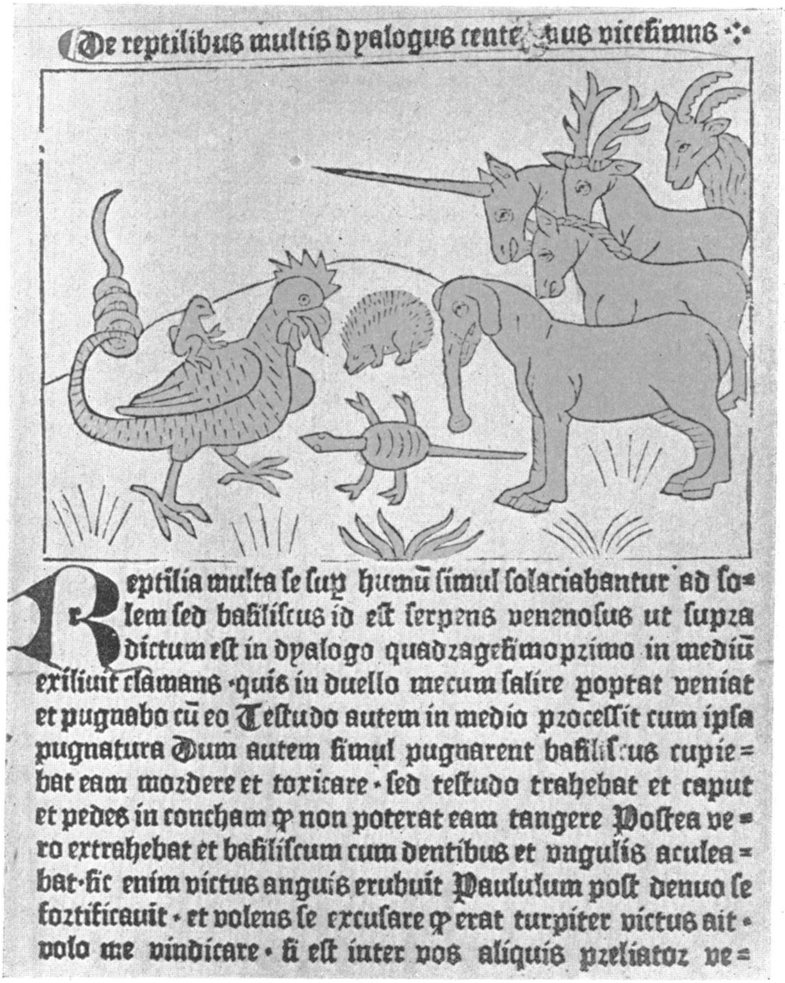
[1] I am indebted to my colleague, Professor James T. Hatfield, for assistance in translating some of the more obscure passages.



De reptilibus multis dyalogus cente[illegible]nus viceſimus

Reptilia multa ſe ſuꝑ humū ſimul ſolaciabantur ad ſolem ſed baſiliſcus id eſt ſerpens venenoſus ut ſupra dictum eſt in dyalogo quadrageſimoprimo in mediū exiliuit clamans ·quis in duello mecum ſalire poptat veniat et pugnabo cū eo Teſtudo autem in medio proceſſit cum ipſa pugnatura Dum autem ſimul pugnarent baſiliſcus cupiebat eam mordere et toxicare · ſed teſtudo trahebat et caput et pedes in concham ꝙ non poterat eam tangere Poſtea vero extrahebat et baſiliſcum cum dentibus et vngulis aculeabat· ſic enim victus anguis erubuit Paululum poſt denuo ſe fortificauit · et volens ſe excuſare ꝙ erat turpiter victus ait · volo me vindicare · ſi eſt inter vos aliquis preliator ve=

FIG. 6. ANIMAL FIGURES IN THE DIALOGUS CREATURARUM (1480). ORIGINAL IN THE J. PIERPONT MORGAN LIBRARY

plates, inserted as leaves separate from the text, one plate at the beginning of each division of the book. The wood-cutting is coarse, and the drawings are by no means so good as those of the "Gart." So far as known these sketches have no forerunners; they are not traditional figures copied from earlier manuscripts, as was frequently the case of illustrations printed before 1530. On ten of the twelve plates there are not less than eighty-six figures of animals (some of the smaller repetitions not being counted). The remaining two plates contain nineteen figures of plants and trees.

The illustrations vary in quality—when the figures are of domestic animals, so that the designer could see examples, the figures are rather good—see the dog and the horse in Fig. 1. The goose, dear to the heart of the German for festive occasions, the falcon (Fig. 2), the woodpecker, the peacock, although crude are evidently drawn from nature. The exotic animals, however such as the camel, the lion, and especially the elephant (Fig. 1), with cleft-hoof and schematic trunk, are very bad—the designer had no specimens to look at. The fishes are not well drawn. The general appearance of the plates with a rough border is shown in Figs. 3 and 4. The plate of animals (Fig. 3), shows several insects—ants, bees, grasshoppers, butterfly,—a spider, a snail, etc. The plate of plants (Fig. 4), shows the grape vine, the apple tree, the pear tree, and other pictures less easily recognizable.

The figures in the "Book of Nature" are the earliest printed pictures of natural history—they mark the beginning of scientific iconography. Arnold Klebs, in his Incunabula Lists (1917), speaking of the "Herbarium" of Apuleius Barbarus, Rome, 1483 (and 1484), says: "Its illustrations, crude formalized pictures of plants, are, with possibly one exception, the earliest ones in a printed book." He does not mention the "Book of Nature," but certainly there were two plates of botanical illustrations in this book published in 1475. The rarity of Conrad's book, and especially of perfect copies, accounts for the little notice it has received and also for misconceptions regarding the number of plates which it contains. Mrs. Arber in her very fully illustrated treatise on herbals reproduces one of the plates from the "Puch der Nature" (1475), and speaks of it as "the single plant figure" with which the book is illustrated. Hugh William Davis, in "Early German Books" has already pointed out that five plates are missing from the copy of the first edition in the British Museum. For the second plate of botanical figures see Fig. 4.

The introduction of pictures into printed books of science was an important step. The preparation of cuts forced observation and sharpened it. Through this means attention was directed to details and observation was promoted. This was an entering wedge of independent observation at a time when observation was struggling for the right to exist. The preparation of the figures required greater accuracy

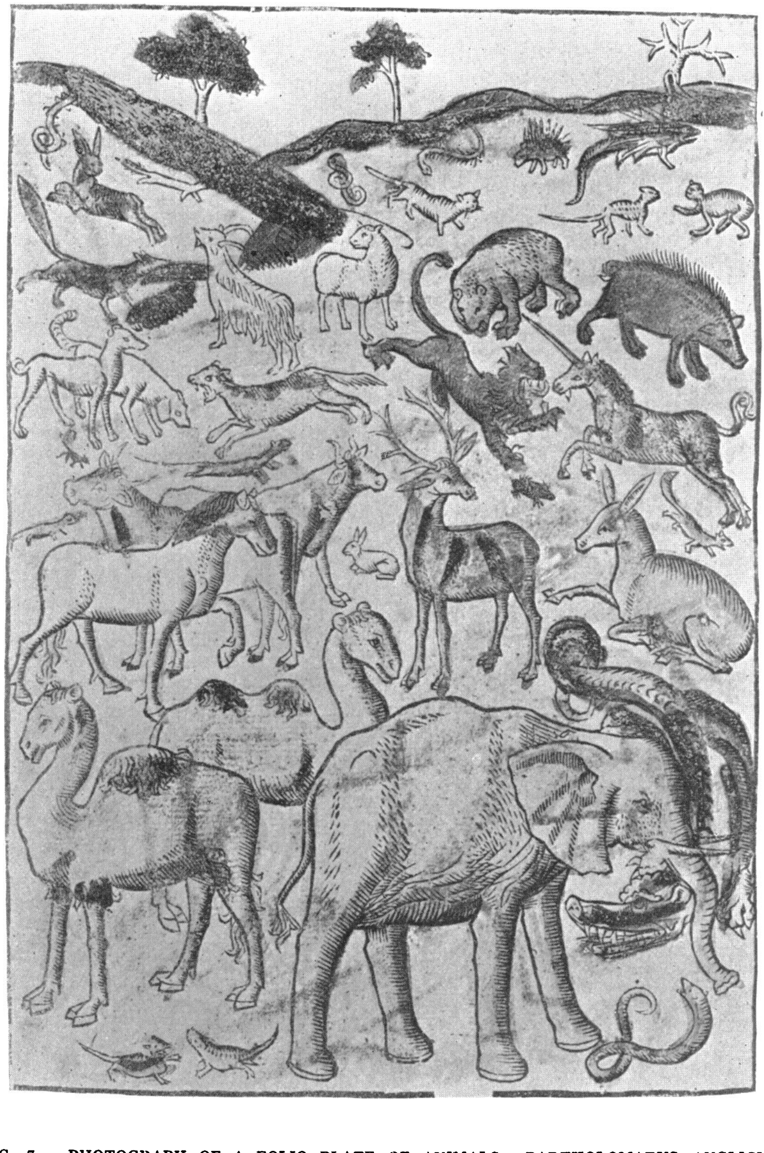


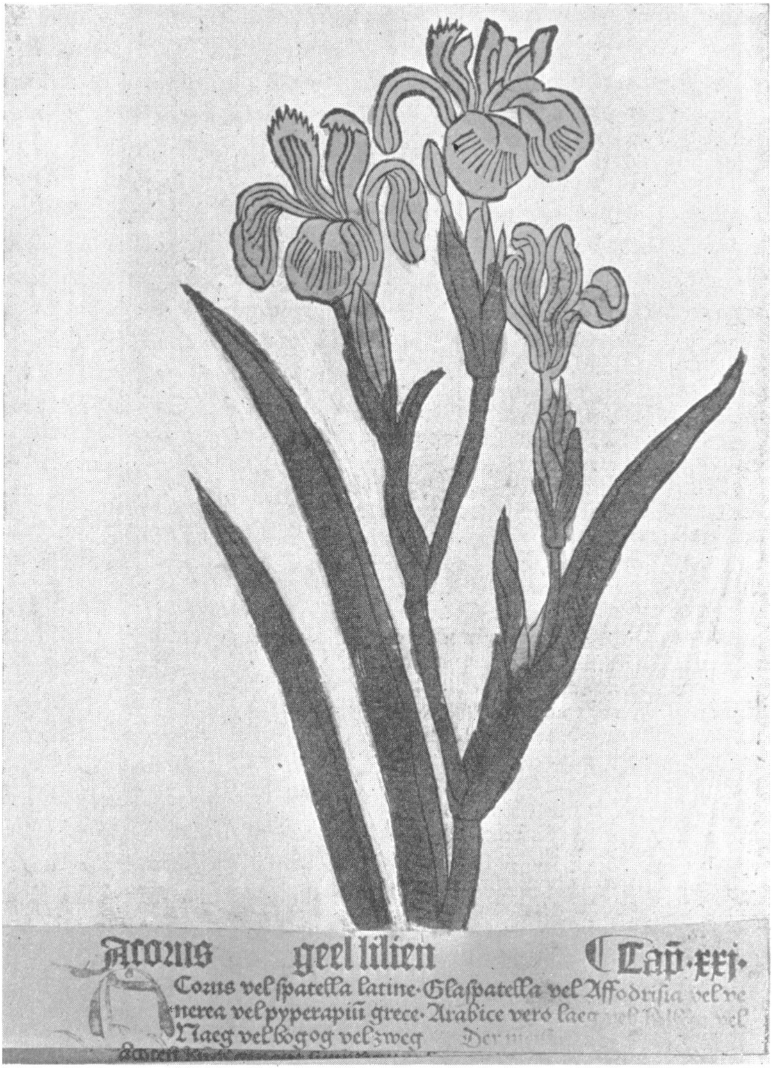
FIG. 7. PHOTOGRAPH OF A FOLIO PLATE OF ANIMALS. BARTHOLOMAEUS ANGLICUS (1486). ORIGINAL IN THE J. PIERPONT MORGAN LIBRARY

and some independent observation and these original efforts were allowed to stand. They did not provoke the hostility of the censors as did original comments. The pictures might pass, but expressions of independent opinion might be contrary to theological doctrine. The pictures of the "Gart der Gesuntheit" were so much more notable that further comment will be withheld until the next section.

It will be interesting for local color to compare figures of animals in contemporary books of different purpose. In connection with the special examination of the "Book of Nature," I also had for use in the J. Pierpont Morgan Library copies with illustrations of Breidenbach's "Travels" (1486); several copies of Bidpai (1486 and others); the "Dialogus Creaturarum" (1480 and others); Bartholomæus Anglicus, in Flemish (1486), and in English (1495); the former with good pictures of animals and plants, the latter with wretched ones.

The single plate of animal pictures in Breidenbach's "Travels" (Fig. 5) contains pictures that are superior as to drawing and as to woodcutting. Although there are some mythical animals represented, the camel and the giraffe are well executed and are evidently drawn from nature. William Morris says, in general, of many pictures in Breidenbach's book: "These woodcuts are remarkable, not only as the best executed illustrations in any medieval book, but as being the first woodcuts in which shading is used in masses and not merely to help the outline." In Bidpai ("Buch der Weisheit" and other titles) is a grotesque figure of an elephant with cleft hoofs and a long bovine tail and also a schematic trunk similar to the one in Conrad's picture (Fig. 1). In the "Dialogus Creaturarum" (1480), there occurs an elephant with the soliped hoof of the horse and with the horse's tail (Fig. 6). Now these are not pictures drawn for a scientific book but as representing the conception of these animals by designers of the time they are significant. The figures in the Flemish edition of Bartholomæus Anglicus (erroneously de Glanville), (Fig. 7), although published in 1486, far surpass those of the English translation, published in 1495, by Wynkyn De Worde. The plate of quadrupeds (Fig. 7), of birds and of plants of the Flemish edition show signs of observation from nature (note especially the elephant in Fig. 7). The figures in the English edition on the other hand are wretched caracitures—some of them being degraded copies of the figures of Conrad's book. Mrs. Arber published the plate of plants from the English edition of 1495, but the botanical plates in the earlier Flemish edition are much superior.

For readers who may be interested in looking over the literature relating to the "Book of Nature" and its translator, I make note of the chief references consulted. Besides the original edition of 1475, I have made use of the analyses of the book by Choulant ("Anfänge wissenschaftlicher Naturgeschichte und naturhistorischer Abbildung in



Acorus geel lilien Cap·xxi·

Corus vel ſpatella latine· Glaſpatella vel Affodriſia vel venerea vel pyperapiũ grece· Arabice vero laeg [illegible] vel Naeg vel bogog vel zweg Der [illegible]

FIG. 8. PHOTOGRAPH OF THE YELLOW FLAG. GART DER GESUNTHEIT (1485). ORIGINAL IN THE SURGEON GENERAL'S LIBRARY

christlichen Abendlande," 1856); by Meyer ("Geschichte der Botanik," 1857); by Sudhoff ("Studien zur Geschichte der Medizin," 1908) and the bibliographical notice by Hugh William Davis in "Early German Books" in the library of G. Fairfax Murray, 1913. In 1861, Pfeiffer published (without illustrations) the entire book under the title "Das Buch der Natur, von Konrad von Megenberg, Die erste Naturgeschichte in Deutcher Sprache." This is a study of the book from the philological standpoint and is accompanied by a dictionary of some 250 pages. There is also a metrical translation in Flemish, and in rimed verse, entitled "Naturen Blœme." This was made by Jacob de Mærlandt who died in 1300, so that his translation preceded that of Conrad. The first part of the Naturen Blœme was published in 1856 and the complete work in 1878.

THE "GART DER GESUNTHEIT"

While the "Book of Nature" had a long history in manuscript, the German translation going back to 1349, the Gart, on the other hand, although a compilation, seems to have been a product of the time—arising about the printing house. It was thus an expression of publisher's enterprise—the excerpts being chiefly made by a physician who acted as the scientific collaborator, and the blocks being cut under the eye of the publisher. No anticipations of the illustrations nor of the text are known, except that the text is pieced together out of earlier writings on nature. From the account in the preface it would appear to have been the product of the combined labors of the original designer, a master of medicine and a skilful artist. The following quotation is taken from Mrs. Arber's translation of the preface:

> Since, then man can have no greater nor nobler treasure on earth than bodily health, I came to the conclusion that I could not perform any more honorable, useful or holy work or labor than to compile a book in which should be contained the virtue and nature of many herbs, and other created things, together with their true colors and form, for the help of all the world and the common good. Thereupon I caused this praiseworthy work to be begun by a Master learned in physic, who, at my request, gathered into a book the virtue and nature of many herbs out of the acknowledged masters of physic. . . . . But when, in the process of the work, I turned to the drawing and depicting of the herbs, I marked that there are many precious herbs which do not grow here in these German lands, so that I could not draw them with their true colors and form, except from hearsay. Therefore I left unfinished the work which I had begun, and laid aside my pen, until such time as I had received grace and dispensation to visit the Holy Sepulchre, and also Mount Sinai. . . . . Then, in order that the noble work I had begun and left incomplete should not come to nought, and also that my journey should benefit not my soul alone, but the whole world, I took with me a painter ready of wit, and cunning and subtle of hand. And so we journeyed from Germany. . . . . In wandering through these kingdoms and lands, I diligently sought after the herbs there, and had them depicted and drawn with their true color and form. And after I had by

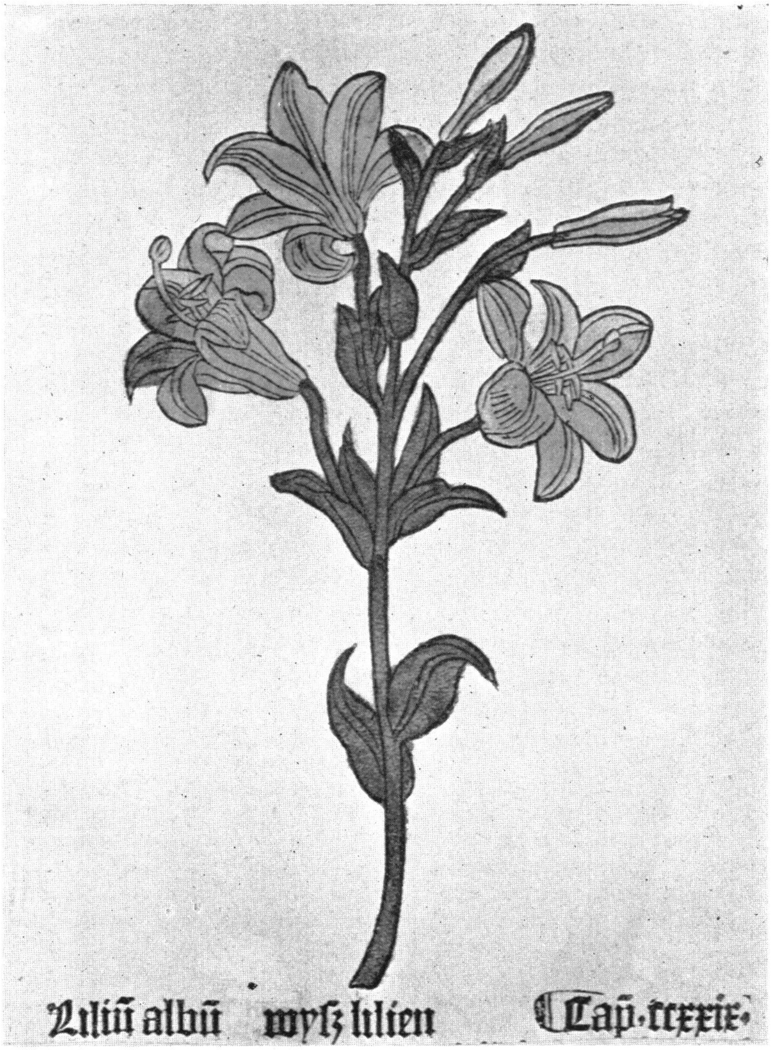


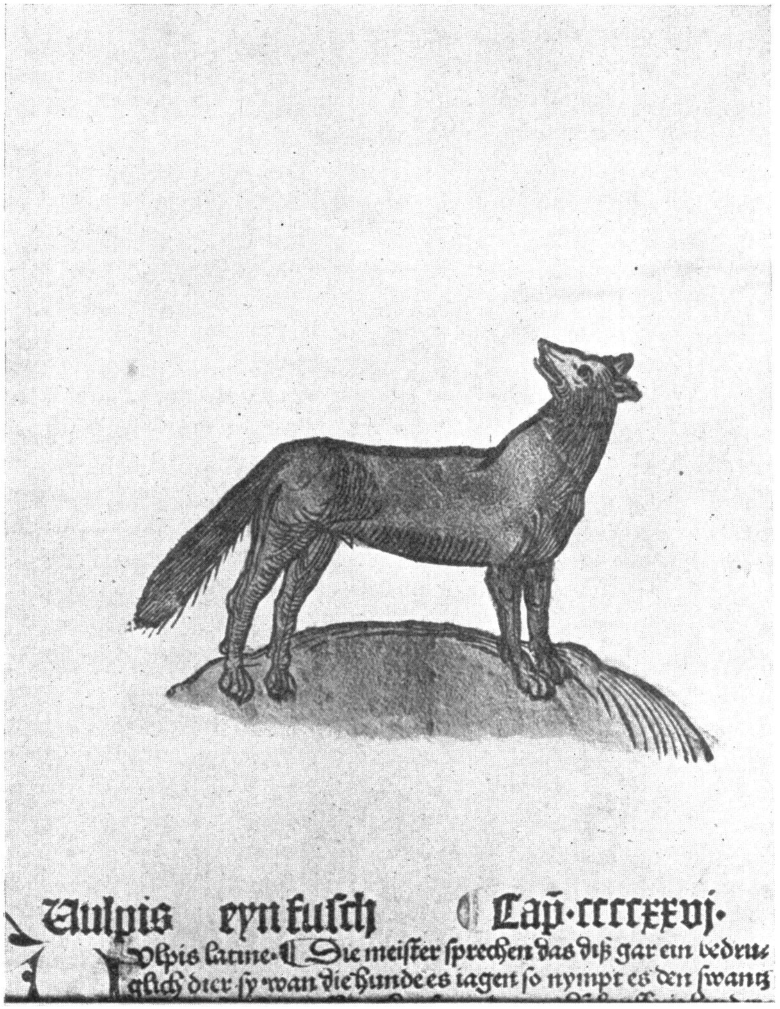
FIG. 9. PHOTOGRAPH OF THE WHITE LILY. GART DER GESUNTHEIT (1485). ORIGINAL IN THE SURGEON GENERAL'S LIBRARY

God's grace, returned to Germany and home, the great love which I bore this work impelled me to finish it, and now, with the help of God, it is accomplished. And this book is called in Latin, *Ortus Sanitatis,* and in German, *gart d'gesuntheyt.*

Considerable confusion has arisen as to the distinctive title by which this work should be known. Choulant, who in 1857, gave the first complete analysis of the book, called it the "smaller Hortus" and thus it came to be confused with the "larger," or true "Hortus Sanitatis" which was first published in Mainz in 1491, and became widely distributed in later editions. Although the "Hortus Sanitatis" owes something to the "Gart" as a forerunner of the same type, it differs in language and in extent—being much more voluminous and having 1066 figures, while the "Gart" originally had a total of 397 illustrations. Most of the pictures of the "Gart" were copied and recut for the "Hortus Sanitatis," but they were degraded and of much lower quality. The "Gart" was originally prepared in German; "the Hortus Sanitatis" was in Latin, but not a translation of the "Gart" although modeled after it and showing generic resemblances to it. Neither was the "Gart" a German translation of the Latin "Herbarius" which preceded it by one year (1484). The text and, notably, the illustrations are different, not only more numerous (150 in the Herbarius and 397 in the "Gart") but of superior quality.

The extant copies are rarely complete and the title page is frequently missing; but, whatever the title on the fly leaf of the various issues and variants of the "Gart"—"Herbarius zu Teutsch," "Ortus," etc., there occurs an unvarying title in every preface—"And this book is called in Latin Ortus Sanitatis, in German ein Gart der Gesuntheit." (From the first Mainz edition, 1485). Arnold Klebs in his Incunabula Lists (1917) has greatly clarified the matter by a complete analysis of what he calls the Hortus family, showing the family to consist of some forty issues of related books—the "Hortus Sanitatis" of 1491 being the central member and the most extensive. The original edition of the "Gart" is the most important for determining the quality of its illustrations and any confusion of title should by all means be avoided. The suggestion of both Sudhoff and Klebs to designate the work by the short title "Gart" is opportune since this gives a distinctive title that can not be confused with that of any other member of the "Hortus" family. The "Gart" is the original of the entire "Hortus" family. The name of the designer of the book is not known but the scientific collaborator is believed to have been Johann de Cube (mentioned on page 127 near the end of chapter 76) and identified by Sudhoff with Johann de Wonnecké, a practicing physician of Frankfurt at the end of the fifteenth century.

A complete copy of the "Gart" of 1485 should contain 356 folio



Vulpis eyn fuſch ¶ Cap̄·ccccxxxvj·

Vlpis latine· ¶ Die meiſter ſprechen das diß gar ein bedruglich dier· ſy ·wan die hunde es iagent ſo nympt es den ſwantz

FIG. 10. PHOTOGRAPH OF THE FOX. GART DER GESUNTHEIT (1485). ORIGINAL IN THE SURGEON GENERAL'S LIBRARY

leaves, 435 numbered chapters with 386 pictures of plants (one repeated) and eleven of animals (one repeated). The copy placed at my disposal at the Surgeon General's Library in Washington has 320 leaves, and 427 chapters but lacks a few intervening leaves. I am greatly indebted to Colonel Garrison and others of the library staff for assistance and opportunity to photograph the plates of the book. Choulant mentions thirteen issues of the "Gart." The number of illustrations varies in the different issues—one edition, with the addition of genre-pictures, has as many as 542 pictures (Klebs). Choulant says that the pictures of the pirated edition, printed in Augsburg five months after the Mainz edition and attributed to the press of Anton Sorg, are for the most part better than those of the original edition. I have been much puzzled by this statement of Choulant as to the quality of the pictures, and, owing to the recognized thoroughness of Choulant's work, am reluctant to question it. However, the book to which Choulant refers (Hain 8949*) is assigned by recent bibliographical experts to the press of Schönsperger. I have recently seen a perfect copy of this in the Newberry Library of Chicago, which is not listed in the Census of Fifteenth Century Books owned in America. It is dated at Augsburg, August 22, 1485, but the name of the printer is not given. As determined by reference to Haebler's *Typenrepertorium,* the book is printed in Schönsperger type, No. 1, and is 120 as to size. There remains the question of the quality of the illustrations—those in the book of the Newberry Library are smaller and inferior to those of the original Mainz edition. I have also seen the Augsburg edition of March, 1486, from the Schönsperger press, derived from the collection of the late Theodore L. De Vinne, and now owned by the John Crerar Library of Chicago. This is a smaller book, printed in two columns instead of full-page, and its illustrations are much smaller and much inferior to those of either the Mainz or the Augsburg edition of 1485.

It is in reference to the illustrations that the "Gart" is especially notable. The pictures are chiefly those of plants, numbering 386, while there are only eleven pictures of animals. The pictures vary in quality, but seven pictures of animals and five or six of plants are of unique perfection among the early printed illustrations. The picture of the yellow flag (Acorus) (Fig. 8), of the white lily (Fig. 9) and of the fox (Fig. 10) are fine examples of drawings from nature. The cut of the yellow flag has been published full-size by Dr. Payne and by Mrs. Arber, but, so far as I am aware, the figures of the white lily, and of the fox and other animals have not been reproduced.

No one can examine the original cuts and retain any doubt that they were drawn from nature by a skilful artist and a careful observer. The lines of the woodcuts are coarse but the few best sketches rival those published by Brunfels (1530) and Fuchs (1542). The best figures in the "Gart" show the highest level to which botanical and zoological illustrations attained not only in the fifteenth century but also in the first third of the sixteenth. Fifty-five years before the renovation of botanical illustration by Brunfels, and sixty-seven years before the publication of the figures of Fuchs, the best pictures of the "Gart" stand out as beacon lights in the development of scientific illustration. They are of singular importance in the history of scientific iconography and are deserving of great praise. An unpredjudiced examination of them can not fail to modify the incorrect estimate as to the quality of all printed illustrations of natural history before those of Brunfels.

In the botanical books that followed for fifty-five years from the printing presses of various countries, the pictures of the "Gart" were copied and recopied, but in the process they were degraded and conventionalized, so that one can get a correct impression as to quality only by examining those of the first Mainz edition. Even so careful and original a student as E. L. Greene, whose "Landmarks of Botanical History" shows great thoroughness, maturity of judgment and first-hand acquaintance with the sources, repeats the generally accepted opinion, saying (p. 195): "To a generation that had been accustomed to such books as the 'Hortus Sanitatis,' filled with the most wretched caricatures of plants in place of true representations of them, this great book of Fuchsius must have appeared as nothing less than luxurious" and again, (p. 167): "Even 40 or 50 years before these fathers of plant iconography there were printed copies of the 'Hortus Sanitatis,' and its German version 'Gart der Gesuntheit' illustrated by some 500 wood engravings of plants. Doubtless the wretched character of these first printed plant pictures, along with the great popularity of the books containing them, were what moved Brunfels to undertake the publication of the 'Herbarium Vivæ Icones.'" Here a direct reference is made to the "Gart der Gesuntheit" (the "Hortus Sanitatis" having 1066 figures, instead of 500). The criticism will apply to the degraded pictures of the "Hortus Sanitatis" but not to the better pictures of the "Gart." The explanation of such an unwarranted sweeping conclusion is doubtless to be set down to the great rarity of the "Gart," and to the belief that, since the "Gart" was an earlier publication of the same type, the pictures of the "Hortus Sanitatis" can be taken as showing the quality of the pictures of the earlier book.

No one can look at the pictures of the dodder, the yellow flag, the white lily, the fox, etc., and consider them as wretched caricatures; they rival the printed pictures in the herbals of Brunfels and of Fuchs as to quality and fidelity to nature.